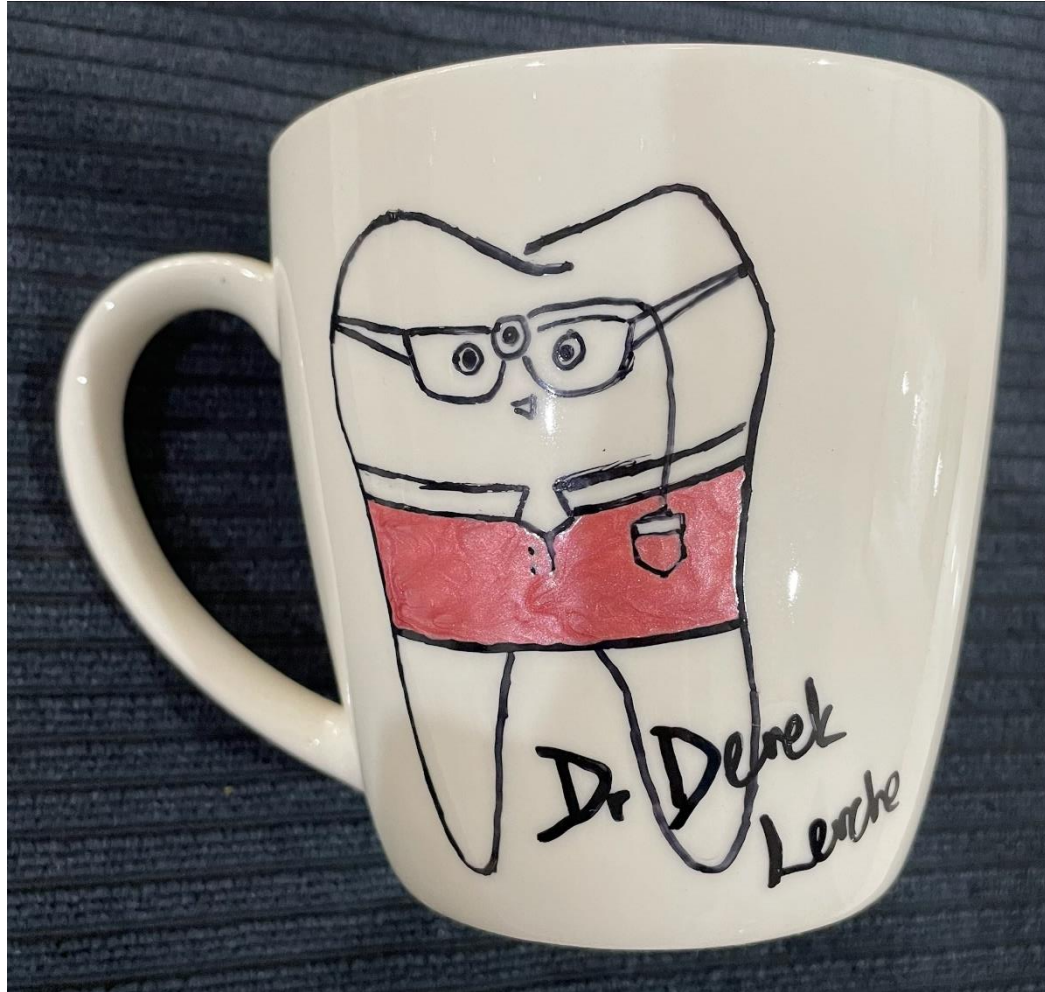


We are privileged to live, work and study on Kurna land, and acknowledge that this privilege comes at a significant and continuing cost to the traditional custodians; past, present and future. Please take the time to visit the Kurna Learning Circle (near Gate 9, North Terrace Campus) to reflect on your own place in this country's history.



Going Loupy

Taking the plunge into loupes/headlamps



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Outcomes

- ▶ To gain a basic understanding of the role and value of dental loupes/headlamps in clinical dentistry.
- ▶ To arm you with (hopefully) enough knowledge on the types of loupes/headlamps available to make informed choices when buying your own loupes.

What and why*

- ▶ Magnifying lenses attached to a protective frame/eyeshield/glasses*
- ▶ Provide improved *vision* to facilitate more improved diagnosis.
- ▶ Assist in providing greater precision in operative dental procedures in general dentistry and specialist areas eg fixed prosthodontics, endodontics (in specialist endodontic practice greater magnification is common-place)*
 - promote improved treatment outcomes for patients
- ▶ Provide improved posture and reduced eye strain*
 - promote safe, healthy work environment
- ▶ Addition of headlamp highly advised

BDS 1-5/ BOH 1-3: Preparing for a long, productive, successful* career in dentistry

- ▶ Adequate magnification helps develop excellent operator posture (ergonomics) while seeing more detail
- ▶ In conjunction with headlamp, excellent lighting (line of sight) helps to ensure maximum visibility
- ▶ CONCERNS with infection control*

*Especially with regards to patient outcomes

Indications for magnifying loupes*

- ▶ To improve visualisation of fine detail
- ▶ To compensate for hyperopia (far-sightedness) or age-related gradual loss of the ability to focus on nearby objects (presbyopia)
- ▶ To ensure correct posture

Use and attitudes*

2020 study across 4 Saudi dental schools <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7414349/>:

→ “significant relationship (<0.05) between the use of dental loupes and lowered levels of reported discomfort in the lower back, neck, shoulders, elbows, upper back and feet”...feet??*

→ “price main barrier to use of loupes” (70%)

→ 66% had used magnification, but only 12.5% were using them at the time of the study...WHY???

➤ Similar 2013 study in UK <https://pubmed.ncbi.nlm.nih.gov/23097188/>

→ use of loupes more common in trainers (but still low at only 44%) than students (28%)

→ increased interest in buying loupe (trainers 50%), students (83.6%)

► Concerns:

1. Inadvisable in certain circumstances (ie LA, exo, rem pros)*

2. Damage to eyesight

→ no evidence of this (deteriorates naturally with age/increased expectations)

3. Takes too long to get used to them, if at all:

→ Don't buy rubbish

→ Get them set up correctly: <https://www.loupedirect.com/how-to-adjust-dental-loupes>

→ Initially limit to 10-20 minutes use each session for the first week

→ Increase to 30-40 minutes in the second week

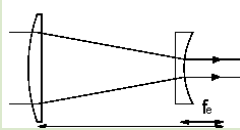
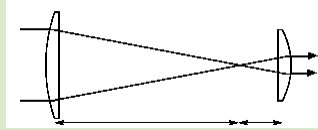
→ Gradually increase until comfortable

Considerations when purchasing loupes

- ▶ Type of magnifying lens: Galilean vs Keplerian (Prismatic)
- ▶ Design of frame
- ▶ Weight
- ▶ Ease of repair (ie old vs new Heine power chord)
- ▶ Cost
- ▶ SUPPORT - local vs internet
www.caveatemptor.org.somewheredoji

Lens considerations

Property/function	Definition/clarification	Consider
Resolution	<ul style="list-style-type: none"> • Ability to differentiate between objects • Depends on quality of lens. • Influenced by quality of lighting ?? 	<ul style="list-style-type: none"> • Look through as many as possible; huge variation depending on manufacturer • Edge to edge clarity
Magnification	<ul style="list-style-type: none"> • Increases the size of the object viewed • Vast array of options 	<ul style="list-style-type: none"> • Personal choice • What type of work will you be doing? • Quality of lens important • Affects DOF and FOV
Working distance	<ul style="list-style-type: none"> • Distance from your eye to the patient's mouth • Operator should be in a comfortable, upright position • Important measurement when getting fitted for loupes 	<ul style="list-style-type: none"> • Set by lens manufacturer • Can adjust with lens inserts (ie Heine) • How tall are you?
Field of view	<ul style="list-style-type: none"> • Controls the amount of patient's mouth/teeth you can see • Greater FOV - less head movement, greater safety 	<ul style="list-style-type: none"> • Want as wide as possible • Increases as working distance increases
Depth of field	<ul style="list-style-type: none"> • Distance between the farthest and nearest objects that are in sharp focus. • If too small, operator needs to constantly "hunt for focus" 	<ul style="list-style-type: none"> • Depends on lens type and magnification • Increased magnification = reduced depth of field for Galilean
Declination angle	Angle between top of ears/corner of eyes and the optical axis of the loupes. Fixed versus adjustable	<ul style="list-style-type: none"> • Critical consideration /measurement when buying/using loupes
Interpupillary distance	Distance between L and R pupils. A critical measurement, can be adjusted with some models	<ul style="list-style-type: none"> • We are not symmetrical • Accurate measurement required

Property	Galilean	Keplerian (Prismatic)
Lens design	Simple. 2 lenses - convex objective, concave eyepiece (higher magnification and clearer image of prescription glasses with only 1 convex lens) 	More complex. Has prism between 2 convex lenses → Superior vision (clarity) 
Magnification	Wide range available	Higher magnification (3.5-8x)
Edge to edge clarity	Depends on quality of optics (cost)	Generally much better than Galilean
Field of view (FOV)	2x: 8 deg 3x: 8-11 deg	Larger for similar magnification 3x: 14-15 deg
Depth of field DOF	Depends on magnification	Better than Galilean Higher magnification = reduced DOF
Weight	Light	Heavier for cheaper models
Usage	First time users General dentistry	Once your brain has already become accustomed to loupes General dentistry More detail-oriented work (F/P, endo)
Cost	Laughably cheap and nasty (ie The Wheate special 😊 \$) to \$\$\$	\$\$\$\$\$\$

Frame design*

- Level of protection provided by frame - close fitting, no gaps at brow, sides and cheek
- ▶ If do not wrap around, must have side shields, and fit as close as possible to the brow and cheeks.
- ▶ Light weight → lanyard if not
- ▶ Frame design/ type of nose pad - does it allow for lenses to be positioned with correct declination?
- ▶ Allows for adjustment of camber of the L and R lenses
- ▶ For 'flip-up' loupes, design allows for quick adjustment of interpupillary distance, camber and declination
- ▶ Allows for the addition of co-axial lighting (head lamp)

Depth of Field

Ability of the lens to focus on both near and far objects (without having to change operator position)

- ▶ As magnification increases, depth of field reduces (even one tooth cannot be seen fully in focus)
 - even slight operator movement can result in loss of focus
 - operator has to “hunt” in and out to find focus*

TRY BEFORE YOU BUY

Declination angle

Is the angle the loupes are declined down towards the work

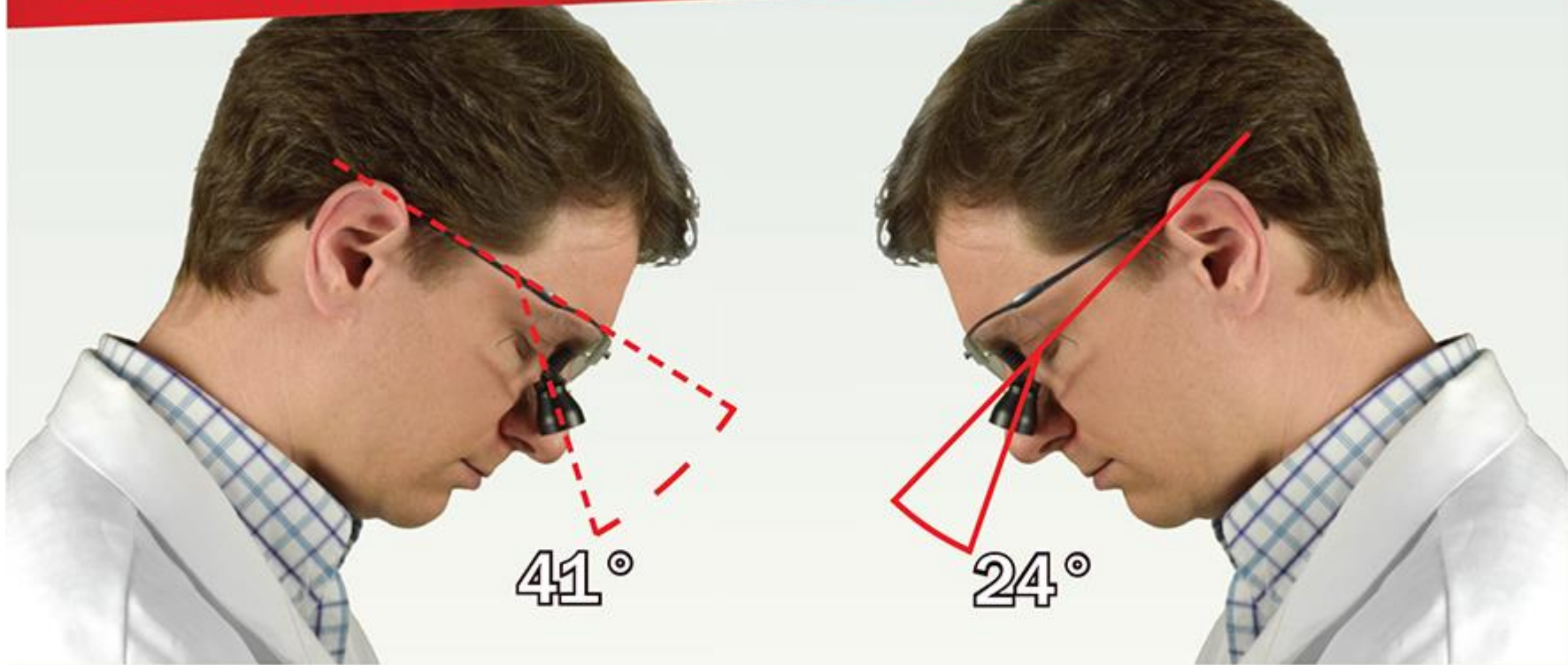
Working with neck flexed forward 20 degrees or more for 70% of working time has been linked to neck pain

→ to reduce risk of musculoskeletal injury, loupes should have a steep declination angle to help you work with less than 20 degrees of forward head posture

Declination must be measured when loupes are worn by the user:

- ▶ Differs according to facial features such as height of nose
- ▶ Don't measure declination using temple arm of frame as reference

Figure 1: DA Measurement



a Overstated declination angle
measured using temple arm reference

True declination angle b
measured using facial reference

Image from: <https://www.surgitel.com/demystifying-declination-angle/>



Though the years

- ▶ 1980's - glue-on 2x was the norm*
- ▶ Circa 2005 - added headlight
- ▶ 2010 - 2.5x generally accepted as appropriate for general dentistry**
- ▶ Beware modern www purchases: show-bag quality optics, dodgy headlamps*



Students' www special*



King-Dental 3.5X Surgical Binocular Loupes Optical Glass+5W LED Headlight Powerfullight with Filter Clip-on Type + Aluminum Box DY-008 (Black)

Brand: King-Dental

★★★★★ 1 rating

\$80⁹⁹



Secure transaction



Returns Policy

Colour Name: Black



\$80.99



\$80.99



\$80.99



\$80.99

Power Source Battery Powered

Colour Black

Light source type LED

Brand King-Dental

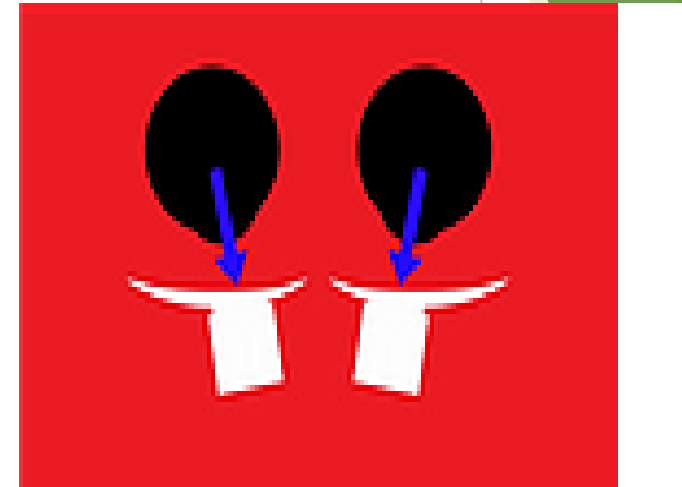
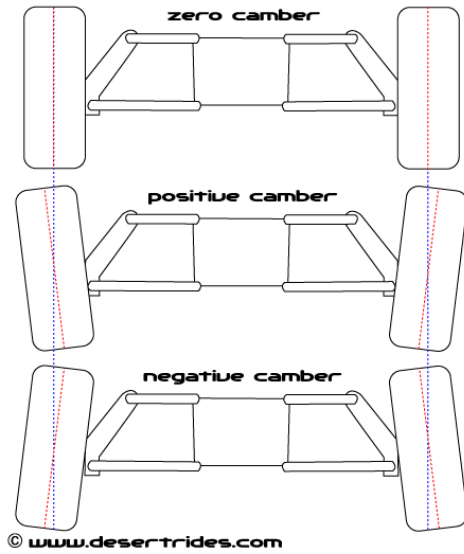
TGA approval??



TGA

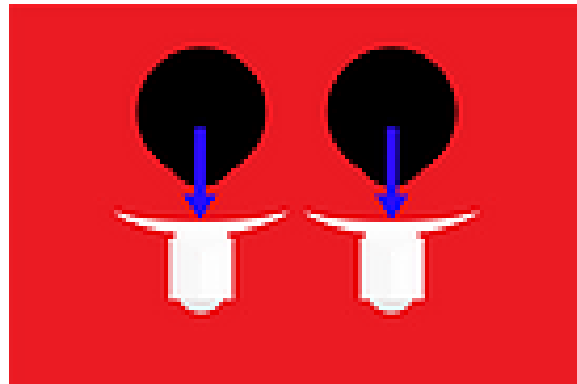
- ▶ The combined effect of current legislation is that non-sterile PPE (including aprons, face masks, gloves, goggles gowns and **visors**) that is presented to be, or claimed to be, for use for the prevention of the transmission of disease between people, **is a medical device**. These products are therefore regulated by the TGA as medical devices under the [Therapeutic Goods Act 1989\(link is external\)](#). They will need to be included in the Australian Register of Therapeutic Goods (ARTG) before they can be supplied.
- ▶ Interpretation → the legislation impacts the supplier of the equipment/device, not the user...??
- ▶ But I'm no lawyer, so...Caveat emptor 😊

Galilean loupes: positive camber



Keplarian (prism) loupes

- ▶ Parallel orientation.
- ▶ Prisms let the incoming light reach the eyes in a parallel direction.
- ▶ Similar to looking at a distant object
- ▶ Causes less muscle stress and fatigue.
→ Less eye strain



Pentax NF2 surgical loupes



Ergonomics



Headlamps

Considerations:

- Colour temperature (degrees Kelvin)
- Weight
- Uniformity across field of view
- Globe life (no issue with LED)
- Battery life (per charge)
- Ease of parts replacement/repair

Colour temperature

- Degrees Kelvin*
 - 2700 - 3300K = warm (yellowish)
 - 4000 = neutral white
 - >4000K = cool (bluish)
 - 6500K = daylight (overcast, cloudy day)
- Luma Dent (<https://lumadent.com/blog/blog-color-temperature>):

5500K Neutral White Light: • Brighter • Exceptional fine detail • Industry standard

4500K Warm Light: • Less reflective, lower eye strain • Slight yellow coloration • Better for color matching



New technology

- ▶ High Definition imaging HDi (Designs for Vision)
 - Uniform light distribution
 - Focussed LED → up to 45% more light



HDi™ Headlight Specifications



LED UltraMini HDi™ *

Weight	0.5 oz. / 14.2 grams
Light Output	55,000 Lux of HDi illumination @ 12 inches
Spot Size	76 mm @ 12 inches
Runtime	High Intensity: 10 hours Medium Intensity: 17 hours
Color Temp.	5800° K

* Panoramic Spot available to cover panoramic loupes field of view providing 40,000 Lux of HDi illumination @ 12 inches



LED DayLite® HDi™

Weight	1 oz. / 28.3 grams
Light Output	100,000 Lux of HDi illumination @ 13 inches
Spot Size	57.2 mm @ 13 inches
Runtime	High Intensity: 6.5 hours Medium Intensity: 8.5 hours
Color Temp.	5800° K



LED Twin Beam® HDi™

Weight	2.9 oz. / 82.2 grams
Light Output	140,000 Lux of HDi illumination @ 16 inches
Spot Size	66.5 mm @ 16 inches
Runtime	High Intensity: 4 hours Medium Intensity: 5.4 hours
Color Temp.	5800° K

Buy local?

- Try before you buy
- Correct set-up for your WD, IPD, DA, camber
- Loan units if your headlamp/battery fails?
- Develop ongoing relationship with suppliers
 - AUDSS
 - After graduation

Buy local

- ▶ AUDSS trade show
- ▶ Saturday April 9th, 1.00 - 3.00pm, G030 LT
 - ByronMedical
 - Orascoptic
 - Surgitel
 - PeriOptix + Ambience face shields
 - Pentax

Possible:

- Examvision
- Zeiss
- BryantDental

Buy local

► Designs for Vision...Infinity VUE (Vision Up Ergonomics)

→ <https://www.designsforvision.com/SurgHtml/S1/S-Open.htm>

→ <https://dfv.com.au/contact>

→ email: enquiries@dfv.com.au

NSW / ACT

VIC / TAS

SA

QLD

WA

NZ

DESIGNS FOR VISION - SA OFFICE

Street Address: Unit 2, 296 South Road, Hilton SA 5033 Australia

Toll Free (Australia): 1800 225 307



Buy local

▶ Ivoclar Vivadent

→ <https://ivde.com.au/dental-products/dental-loupes/magnification-illumination-copy/>

→ Email: info@heine.com.au

VIC, TAS & SA

1-5 Overseas Drive, Noble Park North VIC 3174

Phone: +61 (0)3 9795 9599

Fax: +61 (0)3 9795 9645

Buy local

► OsseoGroup

→ <https://www.osseogroup.com.au/pentax>

→ <https://www.osseogroup.com.au/demo>

AU 1300 029 383

NZ 09 973 5342

support@osseogroup.com.au

F47 2 Slough Avenue

SILVERWATER NSW 2128

Commonwealth of Australia

Buy local*

► Bryant Dental

- <https://bryant.dental/store>
- Refractive: 3.8x, 5.7x, 7.2x
- Prismatic, but not downward looking: 3.5x, 5x, 7.5x
- Halo headlamp: 17-60 hours
- Ignis headlamp: 1 hour, 10 mins - 3 hours, 30 mins

Australia Office

[+ 61 \(02\) 7208 9592](tel:+6172089592)

Suite 18, 13U/175 Lower Gibbes St
Roseville NSW 2069

conciergeau@bryant.dental



Buy local

► Orascoptic:

► Student discount: <https://www.orascoptic.com/en-us/students>

► Our Student benefits include:

- Up to 40% off retail pricing
- Interest free payment plans
- 45-day trial period
- Loupe and light bundle discounts
- Lifetime warranty on telescopes

► Please note, some schools have exclusive partnerships with Orascoptic; reach out to your school representative to find out more.

► Download our Student Buying Guide to learn about magnification & illumination!

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Unit 6, 12 Mars Road
Lane Cove West
New South Wales 2066

► Phone: [+61 2 8870 3000](tel:+61288703000)
Email: kavokerr.orders@kavokerr.com

► NOTE: HDL Prisms: TTL, customizable declination angle, working distance*



No Mangs were harmed
in the production of
this presentation

Thanks!

